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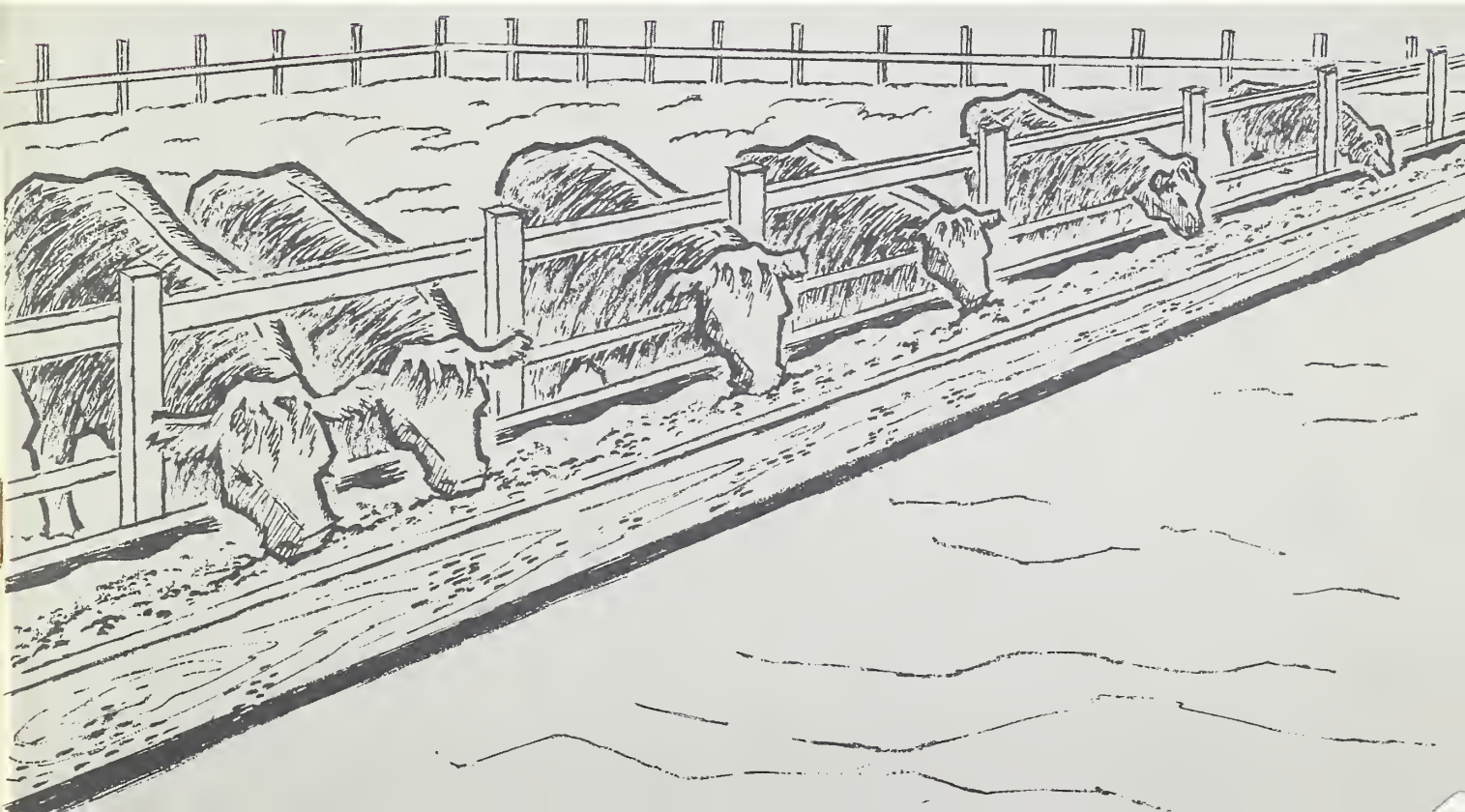
SEASONALITY of CALIFORNIA and ARIZONA CATTLE FEEDLOT OPERATIONS



PREFACE

Producers and others have raised questions about the movement of cattle in the rapidly expanding commercial feedlots in the West. This study was designed to provide information on the trend, seasonal patterns, and some of the pricing relationships of feedlot operations from 1953 to 1958 in California and Arizona. This study is part of a broad program of research being carried out by the U. S. Department of Agriculture to improve the efficiency of the marketing process for farm products.

The California Feeders Association, the Crop and Livestock Reporting Service of the U. S. Department of Agriculture, and the Department of Agricultural Economics of The University of Arizona provided information used in the study.

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May 1960

SUMMARY

Analyses of California and Arizona feedlots reveal some pronounced seasonal patterns in their operations during 1953-58. A knowledge of these seasonal fluctuations is important to producers, feedlot operators, packers, and retailing establishments as a guide to their operations.

Feedlot operators in California and Arizona place relatively large numbers of cattle on feed in early summer and fall and market the finished cattle principally during the late fall and winter seasons. Changes were apparent in the seasonal pattern of cattle moving to feedlots, but no pronounced shifts were observed in the seasonality of cattle on feed or of marketings from feedlots. Seasonal variations in marketings from California and Arizona are more complementary in nature than competitive. Some of the more detailed findings of the study are:

1. The peak month for placing cattle on feed in California in 1953-55 was October, but by 1956-58 this had changed to June. The high placements in Arizona shifted from November to October.

2. Numbers of cattle on feed in California were highest in November during 1953-55 and highest in July during 1956-58. Numbers on feed in Arizona were high from November through February. The seasonal pattern in Arizona has remained fairly stable with only slight variations.

3. The pattern of marketings from feedlots remained relatively unchanged in California during 1953-58, but some changes were evident in Arizona. Marketings in California were relatively high from November through February during the entire period. In Arizona, marketings peaked at an annual high in March during 1953-55 while the high in 1956-58 occurred in April.

4. A comparison of the seasonal peaks and troughs of cattle "placed on feed" and "marketings" showed that cattle in California feedlots remained on feed 3 to 4 months. Cattle in Arizona feedlots were on feed 4 to 6 months.

5. Prices for live Choice grade steers at Los Angeles were high when marketings from California feedlots were below average and prices were low from August to March when California marketings were relatively heavy. The bulk of the Arizona marketings, however, took place when prices were average or higher.

SEASONALITY OF CALIFORNIA AND ARIZONA CATTLE FEEDLOT OPERATIONS

By Raymond A. Dietrich and Willard F. Williams,
agricultural economists
Marketing Economics Research Division
Agricultural Marketing Service

INTRODUCTION

A commercial cattle feeding industry has developed in the Southwest since World War II. Rapid population growth in the metropolitan centers of that area and a growing demand for fed beef stimulated the establishment and growth of large factory-type feedlots in California, Arizona, and some other areas of the West. Feedlots in California and Arizona that feed from 1,000 to 50,000 head of cattle or more annually are in continuous operation.

Marketings from California feedlots increased rapidly after World War II to more than 1 million head in 1953. Most of these were sold from feedlots in southern California and were slaughtered and consumed in the Los Angeles metropolitan area. Arizona's feedlot marketings totaled more than 300,000 in 1953. The bulk of these marketings were shipped into California for slaughter and consumption. 1/

Numbers of cattle on feed in California and Arizona continued to increase rapidly to a peak of more than 1.7 million head in 1955 (table 1). Shipments of feeder cattle from farms and ranches to feedlots leveled off in 1956-58 at about 1.3 million.

Table 1.--Marketings from feedlots, California, Arizona, and total, 1953-58

Year	California	Arizona	Total
	1,000 head	1,000 head	1,000 head
1953	1,034	302	1,336
1954	1,116	326	1,442
1955	1,340	395	1,735
1956	1,291	374	1,665
1957	1,341	393	1,734
1958	1,358	411	1,768
Percentage change 1953-58	+31.3	+36.0	+32.3

1/ Dietrich, Raymond A., and Williams, Willard F. Meat Distribution in the Los Angeles Area. U. S. Dept. Agr. Mktg. Res. Rpt. 347, July 1959, 84 pp.
Seltzer, Raymond E. The Los Angeles Market for Western Cattle. Ariz. Agr. Expt. Sta. Tech. Bul. 137, Tucson, Ariz., April 1959.

Information on changes in trends and seasonal patterns of feedlot cattle operations is essential if cattle producers, feedlot operators, packers, and others are to function efficiently. Producers need to know the seasonal pattern of feeder cattle movements to feedlots in order to take advantage of seasonal increases in prices. Feed producers, feedlot owners, and packers require data on seasonal patterns of cattle on feed to anticipate changes in feed requirements, feedlot facilities, and available supplies of fed cattle. Data on seasonal changes in marketings from feedlots are essential in planning, decision making, and price information at all levels of the marketing system.

Little data on feedlot operations in the Southwest were available prior to 1953. After this date, quarterly estimates were made by the Crop and Livestock Reporting Service of the U. S. Department of Agriculture, and information provided by the California Cattle Feeders Association on a weekly sample basis was improved. The raw data from each of these sources contain the effects of various forces: Long-term trends, shorter term cyclical changes, month-to-month seasonal variations, and residual or "irregular" movements. In this study the trend and cyclical components are separated from the seasonal variations, and the irregular component was removed in order that seasonal variations might be observed and studied separately.

SOURCES OF DATA AND METHODOLOGY

Both the California Feeders Association data published in the Western Feedlot Report and estimates of the Crop and Livestock Reporting Service were utilized. A sample of feedlots was selected from the Western Feedlot Report on which data had been reported continuously during 1953-58. Monthly data on these feedlots were benchmarked into the quarterly USDA estimates. 2/ The resulting estimates are analyzed in this report.

The method used for computing the seasonal indexes is one commonly referred to as the "ratio to moving average method." 3/ The data were processed using electronic computers by a method adopted by the Bureau of the Census. Some of the charts show two seasonal indexes, one labeled "1953-55," and the other labeled "1956-58." The 1953-55 index is weighted most heavily by the 1953 data and the 1955-58 index is weighted most heavily by the 1958 data. 4/

2/ Crop and Livestock Reporting Service quarterly data for Arizona were not available for 1953 and 1954. The missing quarterly totals were estimated by using Arizona data for later years, the California data, and data from the Western Feedlot Report.

3/ Shiskin, Julius. "Decomposition of Economic Time Series," Science, Vol. 128, No. 3338, pp. 1539-1546, Dec. 19, 1958. Mr. Shiskin was responsible for most of the development of the Census program for computing seasonal indexes. He also has presented several detailed papers on the method in addition to the article referred to above.

4/ A caution in use of the seasonal indexes deserves mention. With 1953 and 1958 weighted most heavily in the indexes, an abnormal situation in these years could have had some distorting effect. Unknown errors in estimating some quarterly data for Arizona in 1953 and 1954 also might have introduced distortion. The effects of these errors on the combined California-Arizona seasonals, however, would be small. The methodology provided for some protection against effects of random variation by eliminating or reducing the effects of extreme moving average ratios.

Care should be exercised in using the seasonal indexes in forecasting or predicting future developments. A strong seasonal pattern in marketings from feedlots, for instance, does not necessarily mean that actual marketings in a particular year will follow the seasonal pattern. Chance or irregular factors such as weather or feed conditions, cyclical variations resulting mainly from changes over time in numbers of cattle on farms and ranches, and trends resulting from factors like a change in the demand for fed cattle all exert an influence on actual flow of cattle marketed from feedlots.

TREND OF CATTLE ON FEED

In isolating the seasonal factor, data were developed which show the trend of cattle on feed in California and Arizona more clearly and in more detail than do the annual data of table 1. The combined residual of trend, cyclical, and irregular components shown in index form in figure 1 illustrates for both California and Arizona the sharp increase, mentioned earlier, in numbers of cattle on feed from early 1953 through June 1955. Absence of trend in the California data for 1955-58 also is apparent. Some upward trend in numbers of cattle on feed in Arizona persisted through 1956. But about three times as many cattle were on feed in California during 1953-58 as in Arizona so the continued uptrend in Arizona had little effect on the combined total for the two States.

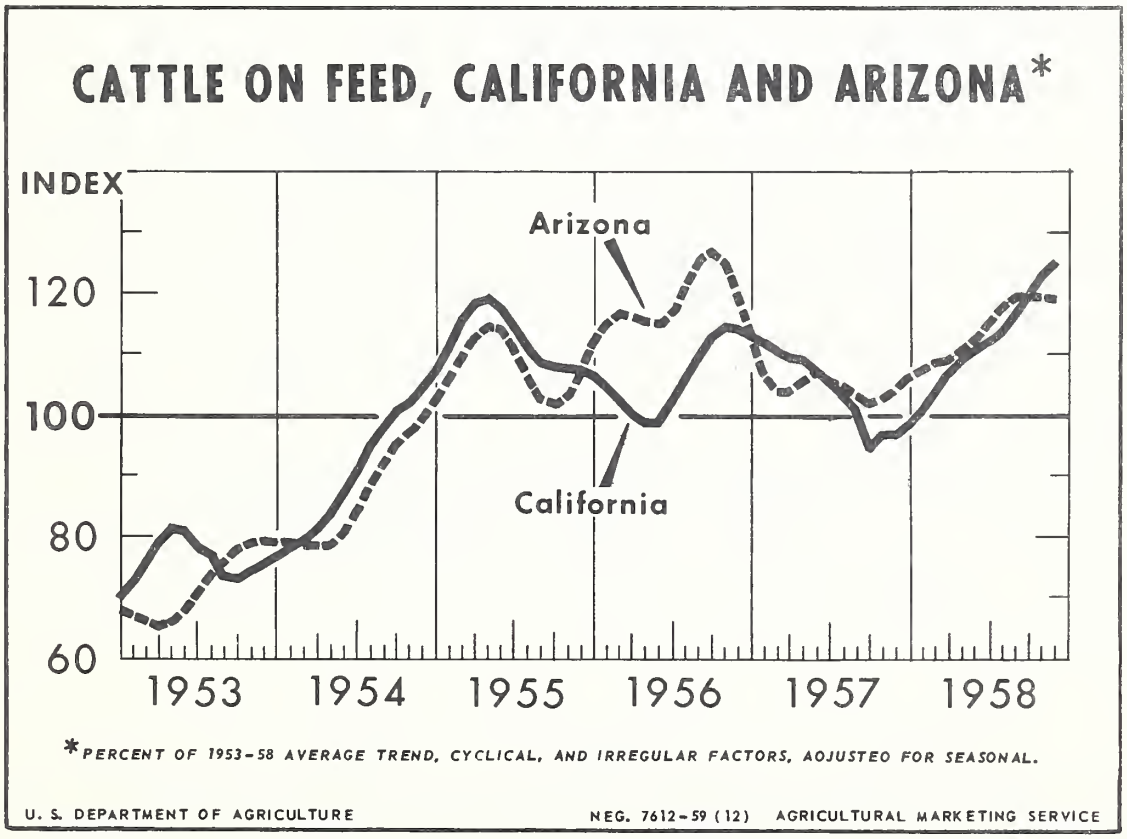

Figure 1

According to a study now being prepared for publication, occasional surpluses of fed cattle were indicated by lower cattle prices for highly finished cattle in 1955 and 1956 at Los Angeles relative to prices for similar grades at Chicago and other large markets in the Midwest and East. 5/ These surpluses were probably the result of a fairly heavy production of feeder and stocker calves in 1954 and 1955 and favorable prices for finished cattle during these earlier years. However, the sharp uptrend in feedlot activity leveled off in 1956-58 partly as a result of somewhat unfavorable prices in 1955 and 1956 and the ensuing shortage of feeder cattle as producers started rebuilding their herds.

THE SEASONAL PATTERN OF FEEDLOT OPERATIONS FOR 1956-58

Seasonality of feedlot operations depends on the time cattle are placed on feed, length of the feeding period, and time of marketing. The seasonal pattern of movements into feedlots in California is different from the pattern in Arizona. Cattle on feed were at an annual high in November and December in Arizona in 1956-58, whereas July is the peak month in California. The peak marketings in the two States occurred in December and January.

Placed on Feed

June was the peak month for placing cattle on feed in California in 1956-58, and October was the peak month for Arizona (fig. 2). More animals were placed on feed in California during May, June, and July than in any period during the year. This pattern is partly due to the fact that most of the cattle come off the ranges in California during this period. The movement of cattle into California feedlots was relatively light from January to April and also during August.

In Arizona, the peak 3-month placement period was October, November, and December. This is also the period that most Arizona cattle come off the ranges. A second peak in Arizona placements occurred in May when cattle come off the desert ranges. Inshipments in Arizona feedlots were below average from January to May and from July to September. Cattle numbers in southern California and Arizona feedlots are decreased by one-third during the midsummer months to allow more pen area per animal.

Since California places a substantially larger number of cattle on feed than Arizona, the seasonal pattern of the combined placements for the two States closely resembles the California pattern. The peak month for combined placements of cattle on feed was June; the second largest month was October. More animals were placed on feed in May, June, and July than in any other 3-month period during the year.

On Feed

The seasonal pattern of cattle on feed is determined by the date cattle are placed on feed, length of feeding period, and available supplies of particular

5/ Willard F. Williams and Edward Uvacek. Pricing and Competition on Beef in Los Angeles. (Now in preparation as a Marketing Research Report.)

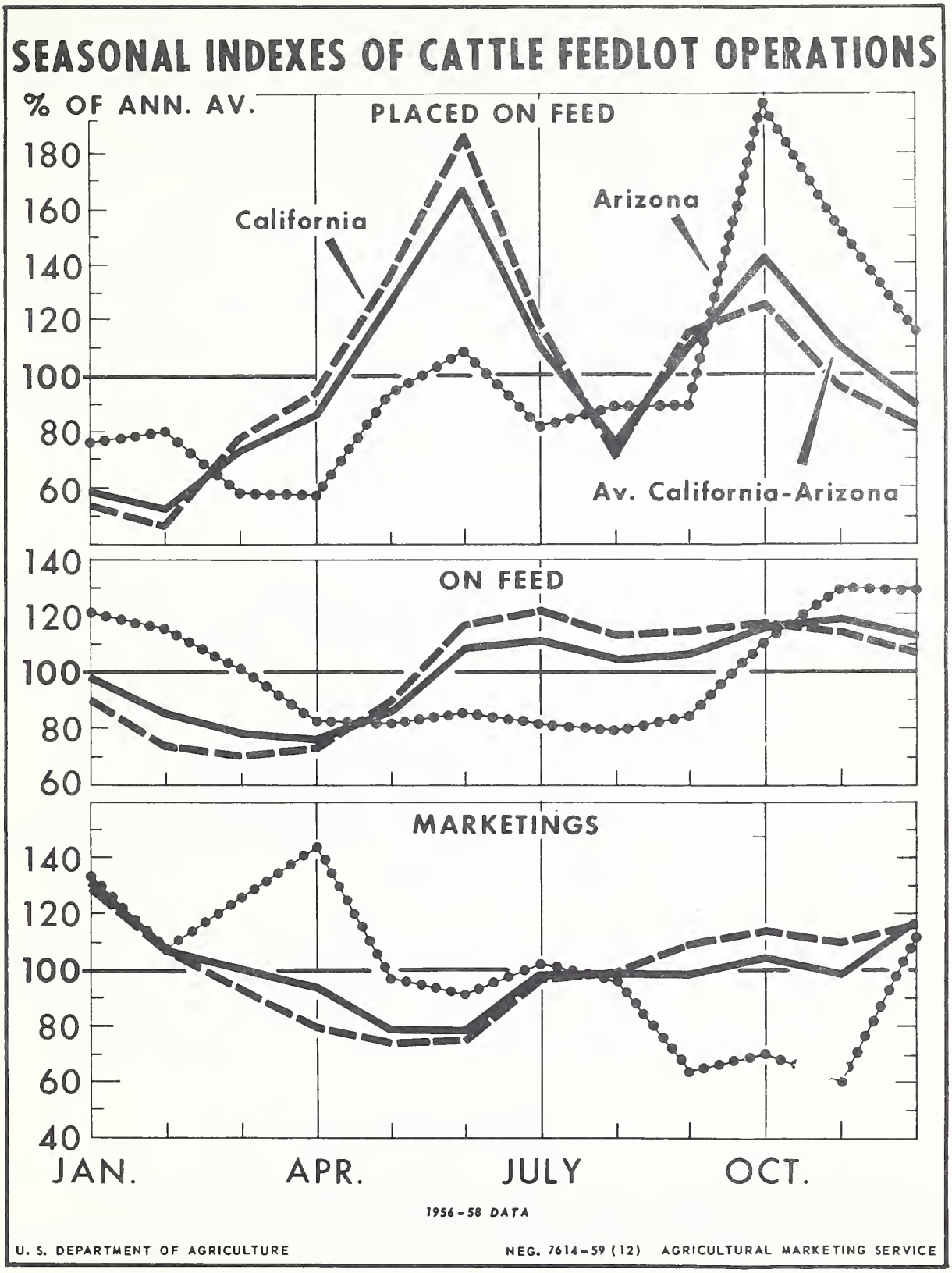
SEASONAL INDEXES OF CATTLE FEEDLOT OPERATIONS
% OF ANN. AV.
PLACED ON FEED
California
Arizona
Av. California-Arizona
ON FEED
MARKETINGS
180
160
140
120
100
80
60
40
JAN.
APR.
JULY
OCT.
1956-58 DATA
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Figure 2

grades of fed cattle relative to the price differential between grades. For example, the price differential between Choice and Good grades may be very narrow during a certain period; consequently, most of the feeder cattle would probably be marketed as Good grade which requires a shorter feeding period than Choice. The seasonal fluctuations of cattle on feed are not as sharp as for placements because some animals are marketed after a minimum amount of feeding whereas others are held for 4 months or more. Marketings are less variable seasonally than placements.

Numbers of cattle on feed in California feedlots in 1956-58 were considerably above average from June through December (fig. 2). The peak month for cattle on feed was July. March was the month of smallest numbers of cattle in California feedlots, although the period from January to May was far below the monthly average for the year.

The seasonal index of cattle on feed in Arizona feedlots forms a very definite and pronounced U-shaped pattern (fig. 2). A relatively large number of animals remained in Arizona feedlots from October through December. Some of these animals were carried over into January, February, and March. Feedlot operations in Arizona remained at a relatively low level from April through September in 1956-58. The largest number of cattle were on feed in Arizona feedlots in November and December.

The seasonal pattern of the combined numbers of cattle on feed for California and Arizona again closely parallels that of California. Numbers on feed were highest from June through December and lowest from January to May.

Marketings

Marketings in California peaked at an annual high in January, but then dropped sharply to an annual low during May and June in 1956-58 (fig. 2). Sales of finished cattle from California feedlots were also comparatively strong from September to December. Sales by Arizona, however, were highest in April and comparatively low from September to November.

The combined California and Arizona marketings again closely resembles marketings from California feedlots. Marketings were at their highest point in January, they dropped to a low in May and June, and then moved upward to a relatively high position in December. Marketings for the most part dipped in late spring and early summer, but moved upward or remained relatively strong during the remainder of the year.

THE CHANGING PATTERN OF FEEDLOT OPERATIONS

Feeding operations in California changed substantially from 1953-55 to 1956-58. During the same period, Arizona feedlots underwent less change. California feeders are now placing more animals on feed in June than in October, the former peak month. This, in turn, has affected the peak feeding and marketing periods.

In 1953-55 the heaviest movement of cattle into California feedlots took place during September-October which was similar to the feedlot movement in the Corn Belt States (fig. 3). However, in 1956-58 a decidedly larger number of cattle moved into California feedlots in June than any other month (fig. 4). The peak spring movement for 1953-55 was substantially lower than that for June 1956-58. On the other hand, the overall fall movement for the later period was somewhat lower than that of the earlier period. In both periods the smallest number of animals were placed on feed in February.

The changing pattern of California placements was brought about by several factors. Some of these were (1) the seasonally low supply of finished cattle in late summer and early fall relative to demand during this period, (2) the resulting higher prices for finished animals during the summer and early fall months, (3) the relatively early growing season in California which produces abundant grazing and many basic feeds, and (4) the accessibility of byproduct feeds in the area.

Although the seasonal pattern has undergone less change in Arizona, the amplitude of seasonal fluctuations in feedlot cattle placements has been more pronounced in Arizona than in California. In 1953-55 the peak movement of cattle into Arizona feedlots took place in November; October was the peak month in the more recent period. A second peak in cattle placements in 1956-58 occurred in June. March and April, and also July and August, were the periods of smallest shipments into feedlots for both periods.

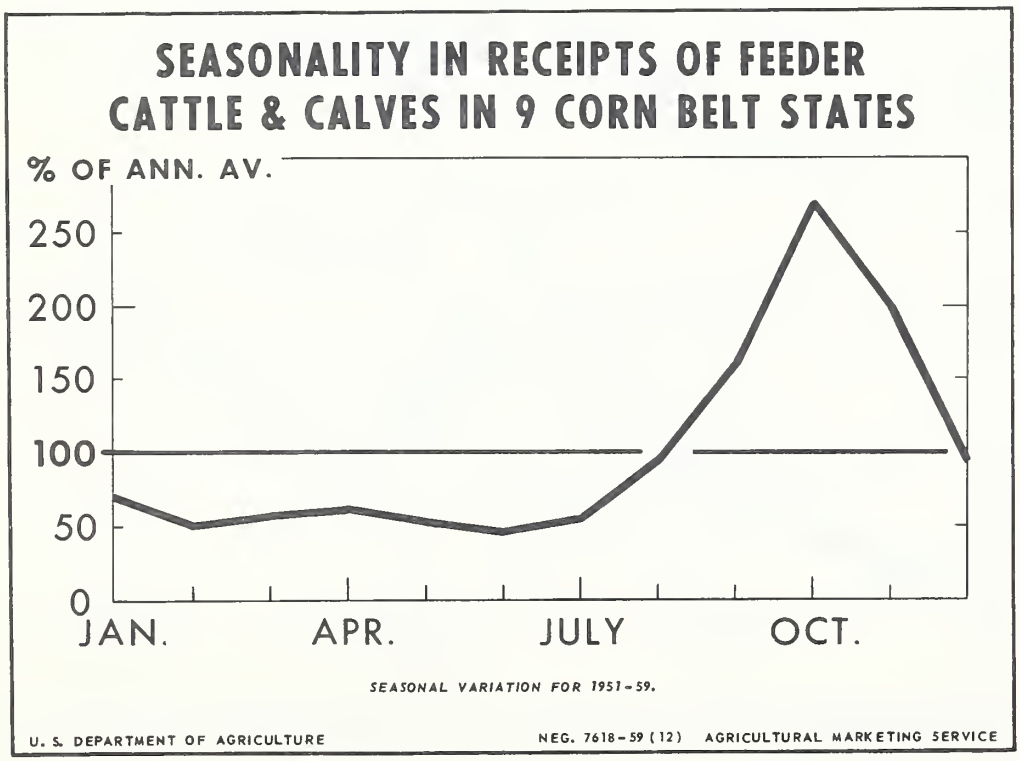

Figure 3

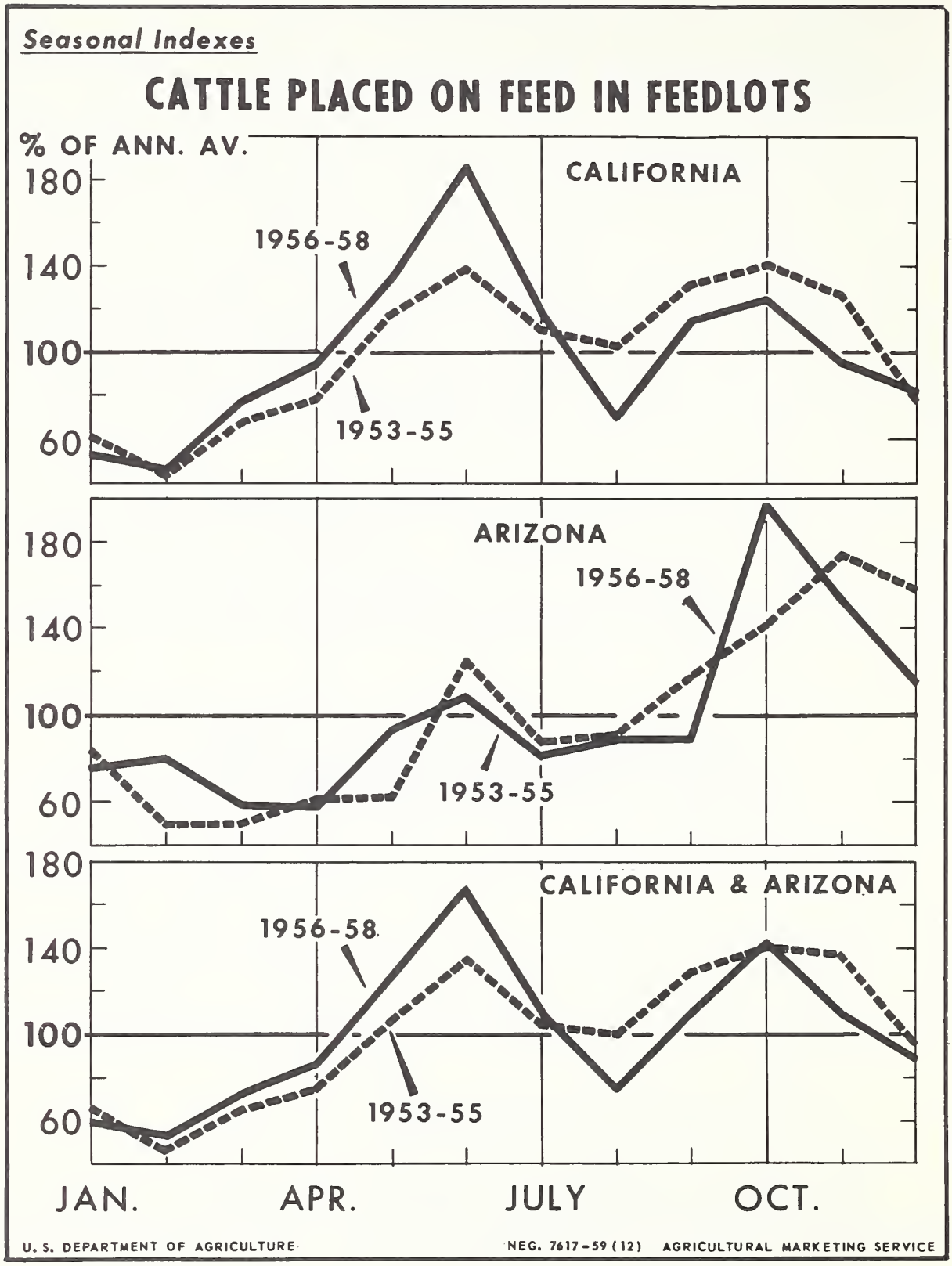
Seasonal Indexes
CATTLE PLACED ON FEED IN FEEDLOTS
% OF ANN. AV.
CALIFORNIA
1956-58
1953-55
180
140
100
60
ARIZONA
1956-58
1953-55
CALIFORNIA & ARIZONA
1956-58
1953-55
JAN.
APR.
JULY
OCT.
U. S. DEPARTMENT OF AGRICULTURE
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Figure 4

The seasonal pattern for the combined placements of the two States shows the peak months for placing animals on feed were October, November, and June in 1953-58. More recently the placements have peaked at their highest level in June followed by a lower second peak in October. Placements, however, have dipped lower in August.

On Feed

The peak month for cattle on feed in California was November in 1953-55 and July in 1956-58 (fig. 5). Although feeding during October-December has decreased in importance relative to the midsummer feeding operations, actual numbers of cattle on feed were still slightly higher in the fall of 1958 than during the midsummer feeding operations. In both 1953-55 and 1956-58, the period from February to April represents the low in numbers of cattle on feed in California. More cattle are generally on feed in California from June through December than in the first 5 months of the year.

The pattern of cattle on feed has changed very little in Arizona. Numbers of cattle on feed were at an annual high from November to February in both 1953-55 and 1956-58 (fig. 5). The peak in California operations, as may be recalled, took place in July in 1956-58. Arizona feedlot operations dipped lower in May during 1953-55 than in 1956-58, but the June feedings appeared to be moving upward compared to 1953-55.

There were no sharp changes in the seasonal pattern of the combined California and Arizona cattle on feed. From April to August, numbers on feed were at a higher level in 1956-58 than in 1953-55, with the largest increase taking place in June and July. Volume of cattle on feed during the first two and last two months of 1956-58 decreased relative to 1953-55. This decline is due primarily to the upsurge in numbers on feed in June and July and not to a general decline in feeding operations.

Marketings

The market movement of finished cattle from California feedlots has undergone little change from 1953-55 to 1956-58 (fig. 6). Marketings were higher in the later period from April to June, a traditional low for finished cattle, and also from November to January than in 1953-55. January, however, is still the most important month for marketing finished cattle.

Sales of finished cattle from Arizona feedlots reflect some change from 1953-55 to 1956-58 and also some trend toward stabilization (fig. 6). The peak marketings in Arizona occurred in March in 1953-55. But by 1956-58 the peak marketing month was April, although at a lower level than the March high for the earlier period. Marketings in both periods declined after peaking in the early spring, remained at a low level during the summer, and then moved upward in December.

The seasonal indexes of the combined marketings from California and Arizona feedlots show some up-and-down movement at similar levels in both 1953-55 and 1956-58 (fig. 6). Marketings in 1956-58 were higher than in

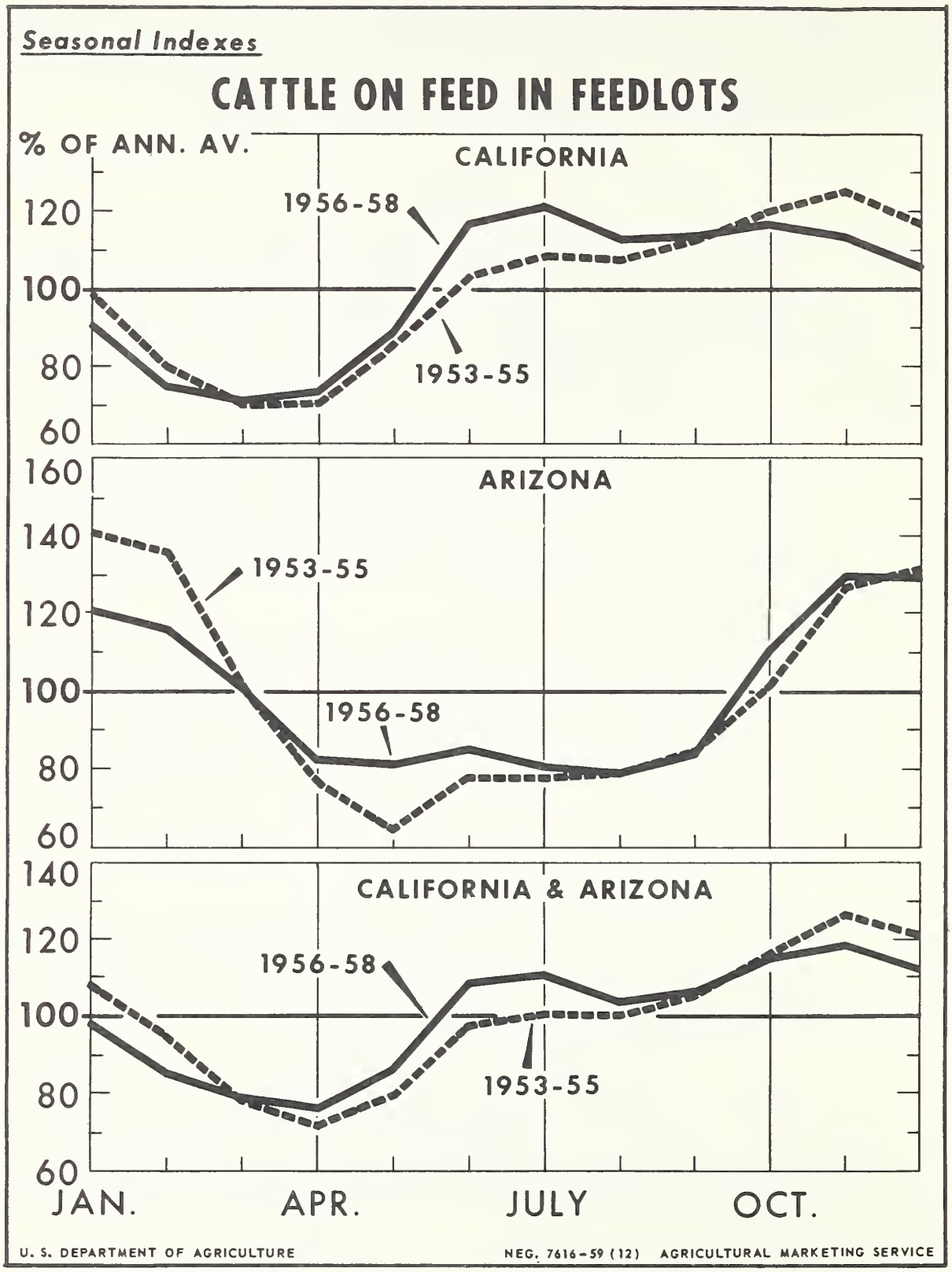
Seasonal Indexes
CATTLE ON FEED IN FEEDLOTS
% OF ANN. AV.
CALIFORNIA
1956-58
1953-55
120
100
80
60
ARIZONA
1953-55
1956-58
160
140
120
100
80
60
CALIFORNIA & ARIZONA
1956-58
1953-55
140
120
100
80
60
JAN.
APR.
JULY
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Figure 5

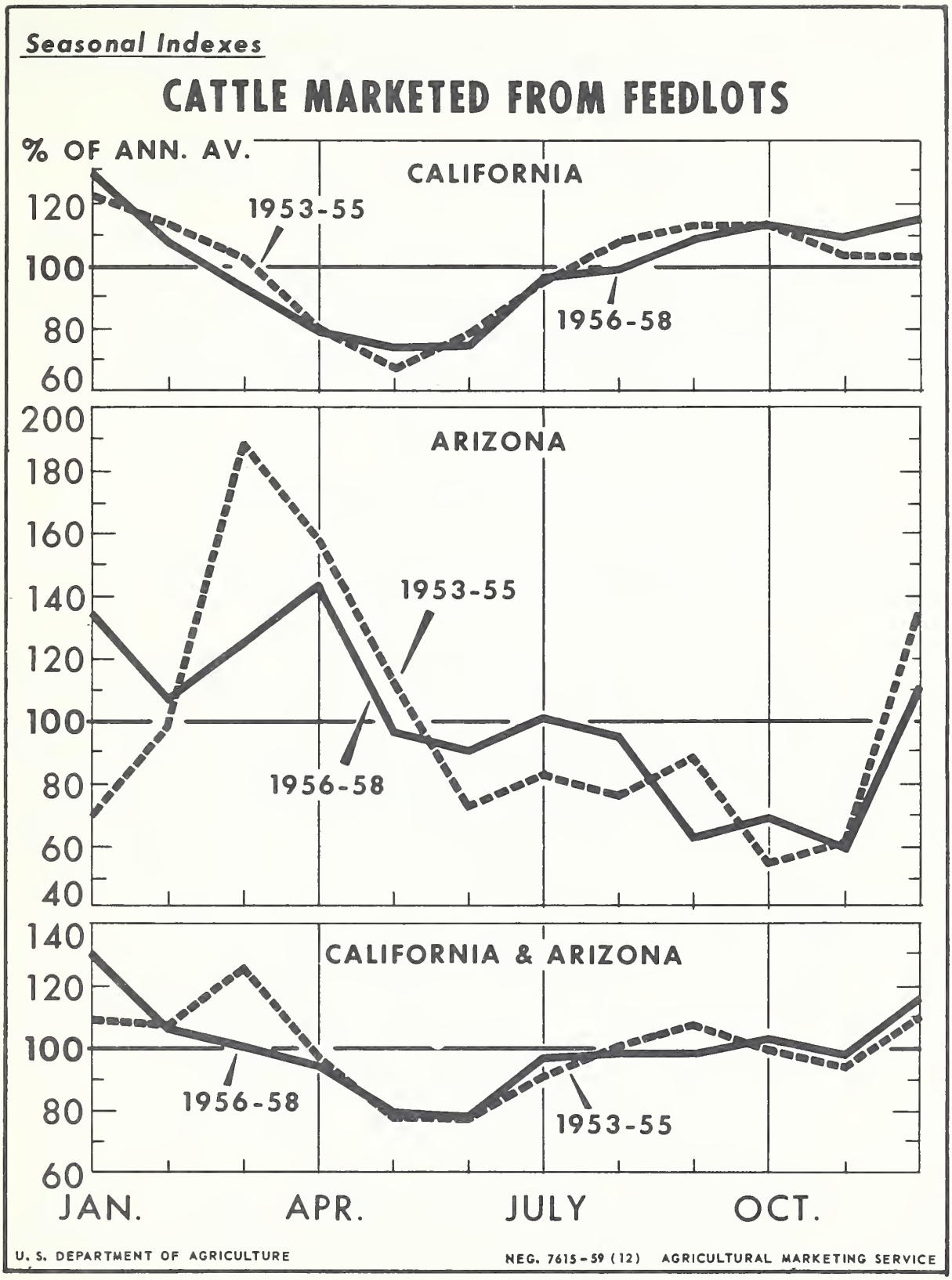
Seasonal Indexes
CATTLE MARKETED FROM FEEDLOTS
% OF ANN. AV.
CALIFORNIA
1953-55
1956-58
120
100
80
60
ARIZONA
1953-55
1956-58
200
180
160
140
120
100
80
60
40
CALIFORNIA & ARIZONA
1956-58
1953-55
140
120
100
80
60
JAN.
APR.
JULY
OCT.
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Figure 6

1953-55 from May to July, from October to December and in January. The combined marketings of California and Arizona from 1954 to 1958 (figure 10) shows a continued upward movement in January as a result of the increased Arizona marketings in January.

RELATIONSHIP OF MARKETINGS TO PLACEMENTS ON FEED AND SEASONAL INDEXES OF PRICES

Some very distinct and pronounced interrelationships can be observed by comparing seasonal patterns of marketings with placements on feed and with prices. In the very short run, numbers placed on feed provide a good yardstick of expected marketings within a relatively short time for slaughterers, buyers, and producers. This may lead to adjustments and counteradjustments on the part of producers and slaughterers who have ready access to information pertaining to numbers placed on feed and prices.

Marketings and Numbers Placed on Feed

Cattle are generally marketed from California feedlots within 3 or 4 months after the onset of the feeding period (fig. 7). In almost all instances, the peaks and troughs in numbers placed on feed are followed by very similar peaks and troughs in marketings 3 or 4 months later.

Similar seasonal patterns in the movement of cattle placed on feed in California feedlots can be detected from 1953 to 1958 (fig. 7). That is, peaks and troughs occurred at approximately the same time each year, although the amplitudes changed from year to year. During 1953, June and October were about of equal importance for placing cattle on feed. By 1958, however, placements peaked considerably higher in June than October. The peaks and troughs in marketings from 1953 to 1958 have not changed substantially. January was the most important month for marketing finished cattle during this period and the marketings have also remained at approximately the same relative magnitudes.

Cattle placed on feed in Arizona feedlots are marketed within 4 to 6 months after initiation of the feeding period in contrast to the shorter feeding period in California (fig. 8). The longer feeding period in Arizona is due to a variety of reasons. Some of these are: (1) Arizona feedlots generally obtain more animals of the crossbreed varieties, which often may not have the initial finish of those entering California feedlots, (2) the shortage of irrigated pasture, as well as native winter pasture in Arizona, and (3) California feeder cattle are often "warmed up," a practice which is not prevalent in Arizona. 6/

The seasonal variations in the placements and marketings of California and Arizona feedlots and the magnitude of these variations differ in many respects, but they are about as complementary in nature as they are competitive. Although both States market relatively large numbers of finished cattle in January, the seasonally high marketing peaks occur at different times during the remainder of the year in each State.

6/ "Warmed up" refers to the practice of placing animals on a supplemental feeding program prior to movement into feedlots.

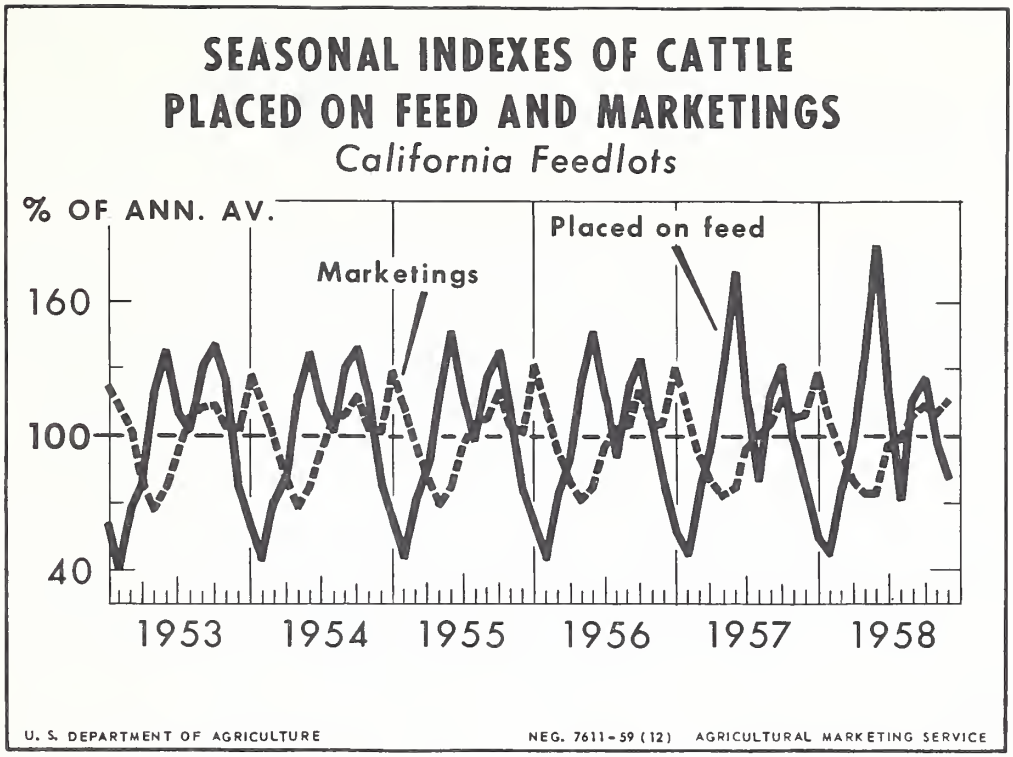

Figure 7

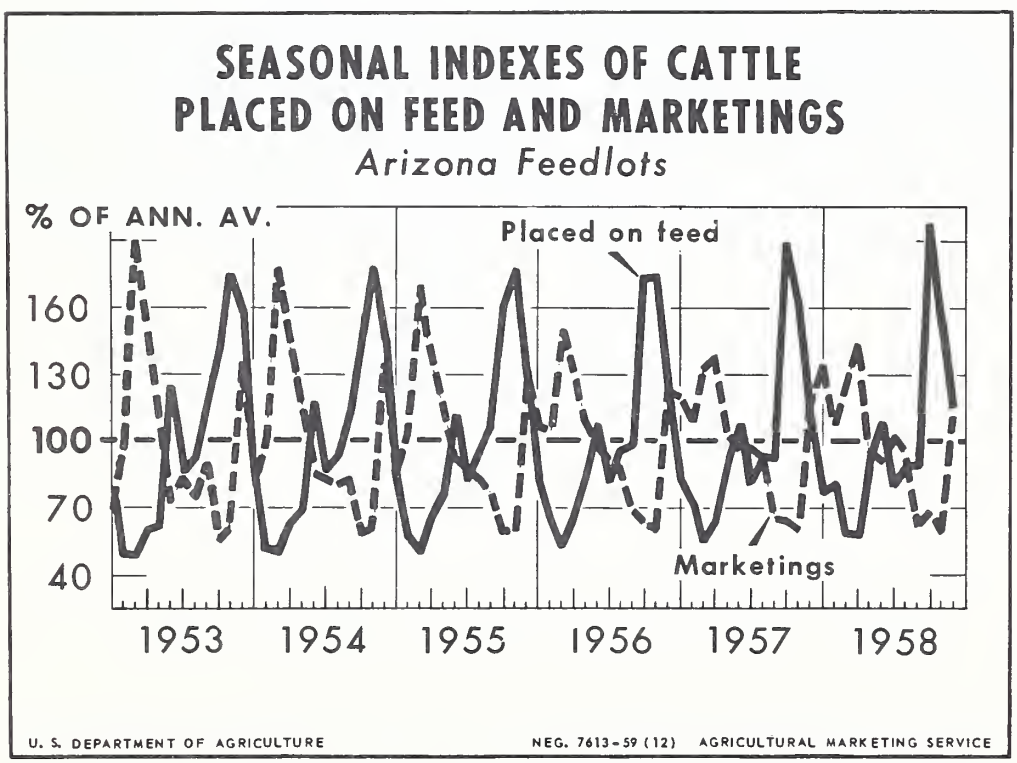

Figure 8

Marketings and Prices for Live Cattle

The buying or selling of livestock is of paramount importance to the success of commercial feeders, packers, and producers. An aid to buyers and sellers is the relationship between marketings and prices received by feedlot operators.

Marketings from California feedlots are inversely related to prices received at Los Angeles for live, Choice, 900-1,100 pound steers from 1953 to 1958 (fig. 9). In general, prices for Choice steers were highest from March through September when marketings from California feedlots were comparatively low. Prices for finished animals, however, were at their lowest levels from October through February, a period when marketings were relatively high.

Because Arizona feedlot marketings (1) peaked during different months than did California marketings, and (2) were not large enough to affect substantially the Los Angeles market prices, Arizona feedlot operators generally were able to market their cattle when prices were average or higher (fig. 9). Sales of finished cattle from Arizona feedlots in 1953-58 were highest in March when prices were about average. On the other hand, Arizona sales of feedlot cattle were lowest in October and November, when prices were low and declining.

When combined marketings from California and Arizona were highest, prices for Choice grade steers at Los Angeles were at the lowest levels and vice versa (fig. 10). This was true for 1955-57 but not for 1958. Prices for Choice steers in January 1958 were moving upward at the same time that marketings from feedlots were moving upward at a very sharp pace. This was due principally to the shortage of grass-fed cattle. The improved range conditions throughout the Western States during 1957-58 brought about a strong demand for replacement stock. Packers, consequently, were forced to rely on feedlot supplies for beef they normally obtained from lower quality animals. The seasonal index of the combined marketings from California and Arizona feedlots from 1954 to 1958, however, appears to be a fairly reliable indicator of the price movement for Choice grade steers on the Los Angeles market.

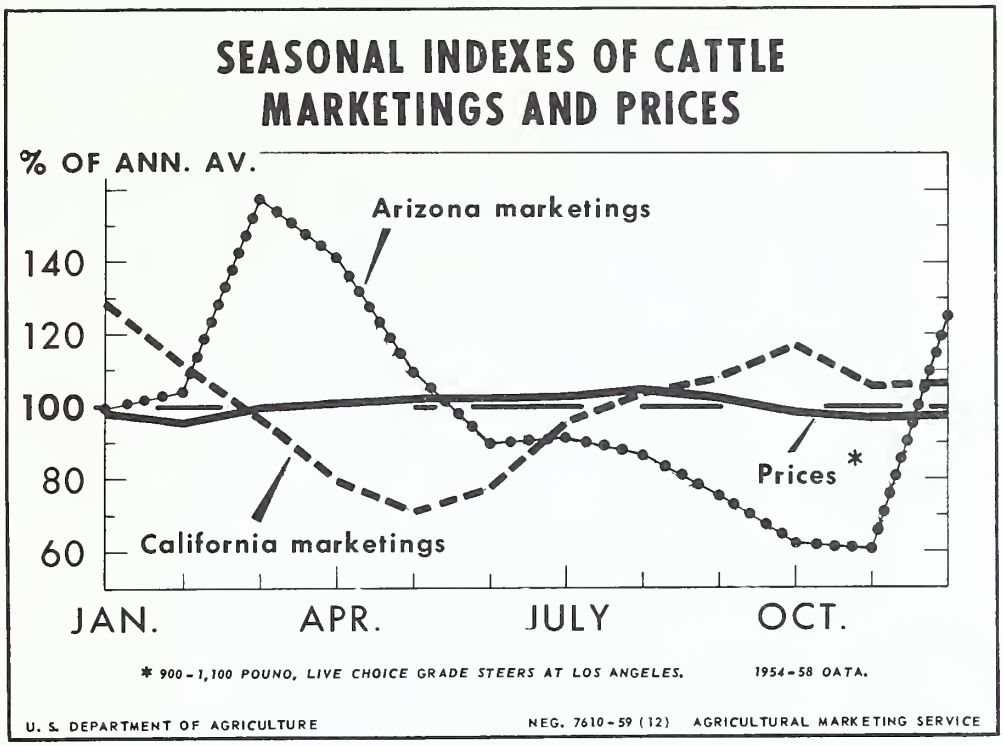

Figure 9

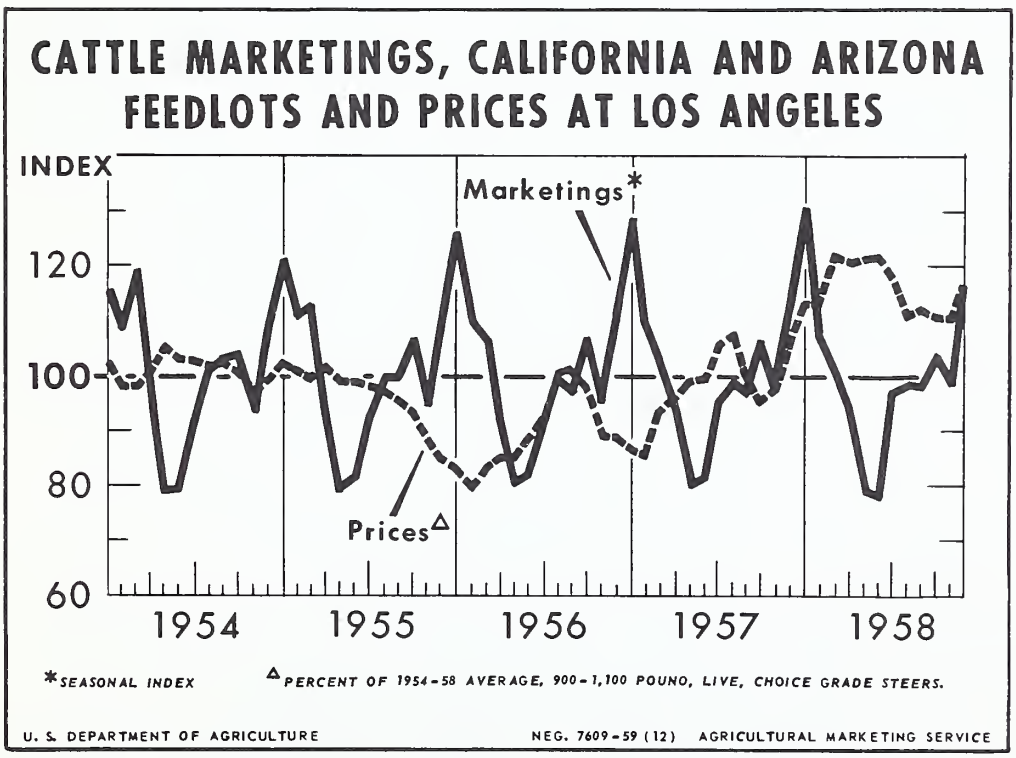

Figure 10